

AVENUE

Avenue™ signal integration system

Model 7410 Quad HD Tri-Level Sync Generator Data Pack

ENSEMBLE

D E S I G N S

Revision 1.1 SW v2.0

This data pack provides detailed installation, configuration and operation information for the **7410 Quad HD Tri-Level Sync Generator** as part of the Avenue Signal Integration System.

The module information in this data pack is organized into the following sections:

- Module Overview
- Applications
- Installation
- Cabling
- Module Configuration and Control
 - Front Panel Controls and Indicators
 - Avenue PC Remote Control
 - Avenue Touch Screen Remote Control
- Troubleshooting
- Software Updating
- Warranty and Factory Service
- Specifications

MODULE OVERVIEW

The 7410 module is a stable timing source suitable for local reference generation for use in broadcast, remote trucks and post-production. Four simultaneous HD tri-level sync reference outputs are provided. Each output can each be set to a different HD standard.

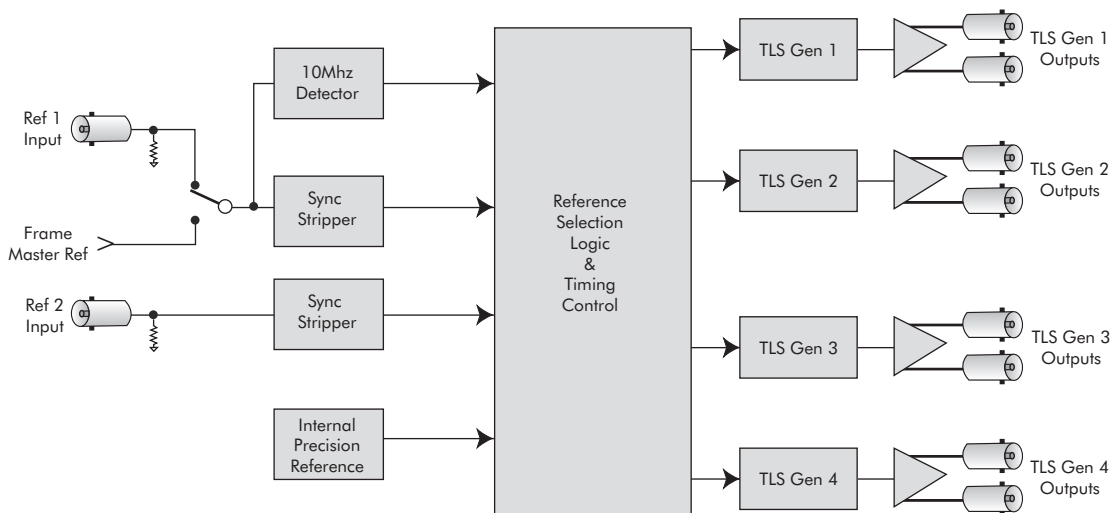
The 7410 can operate from an internal precision frequency reference as a stand alone master sync generator or lock to a PAL or NTSC video reference from an external source. There are two video reference inputs on the 7410 module for maximum system flexibility. The module can also lock to an external 10 MHz source such as an atomic standard or GPS receiver for more precision.

Each of the four outputs can be timed with respect to the selected reference to any point in the television frame. Timing adjustments are configured independently and the 7410 can be configured to output 525 and 625 standards simultaneously.

As shown in the block diagram below, the time base reference is selected from either the Master reference or of two Genlock (external) references. The selected reference passes through a precision sync separator to derive the required sync components. The separated sync signal provides the timing reference for the PLLs.

Power is derived from the ± 12 volt frame power. It is regulated to the required +5 volts for the module by on-board regulator. The module is fused with a resettable fuse device. If the fuse opens due to an overcurrent condition, the module will lose power. After pulling the module, the fuse will reset automatically requiring no replacement fuse.

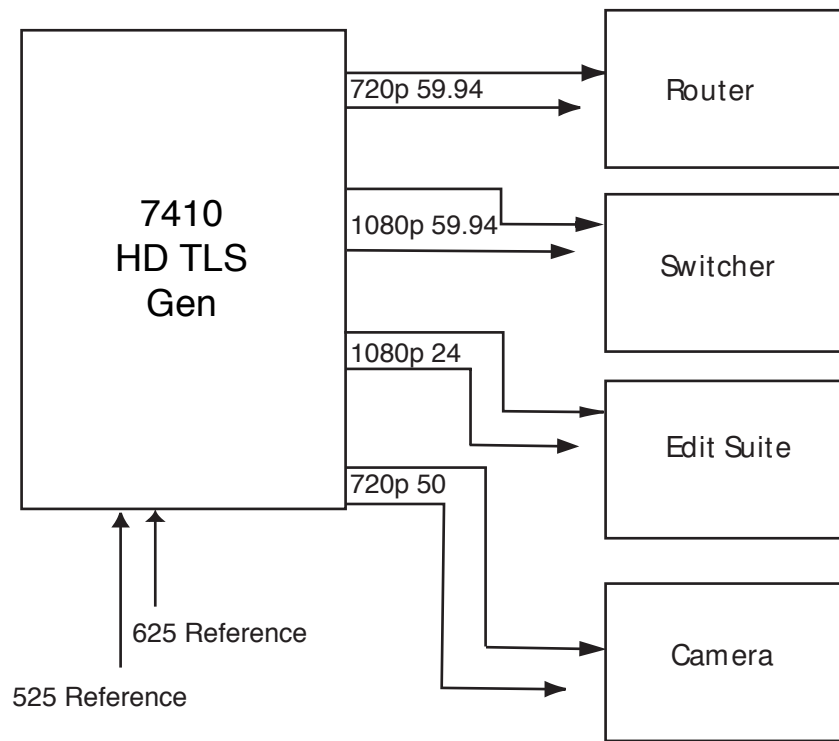
The on-board CPU can monitor and report module ID information (slot location, software version and board revision), and power status to the optional frame System Control module. This information can be accessed by the user or set to register an alarm if desired using the remote control options available.



APPLICATIONS

Simultaneous References

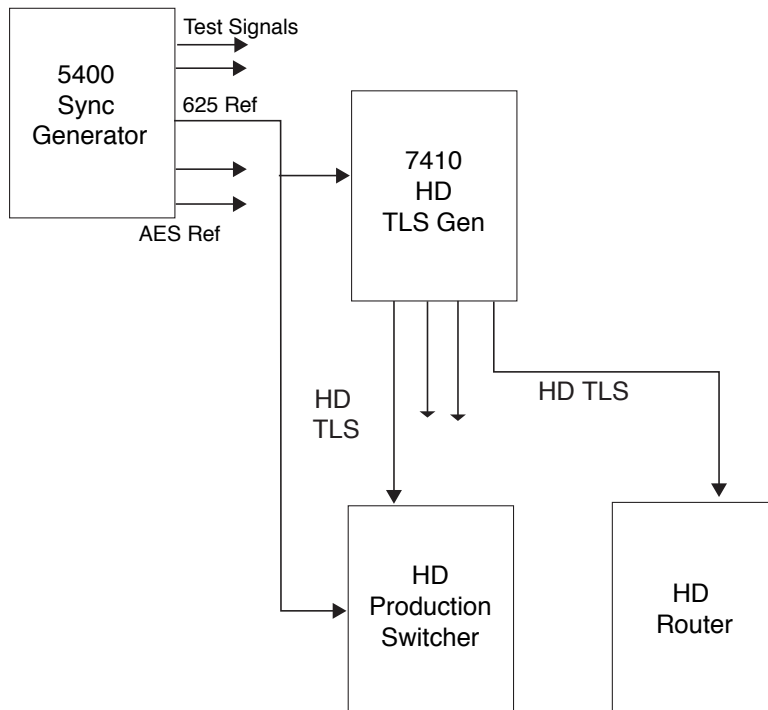
As shown in the application below, the 7410 module can provide simultaneous HD Tri-Level Sync reference outputs that are different standards.



7410 HD TLS Gen Block Diagram

Digital, Analog and Audio Reference Generation and Distribution

Another application shown below, illustrates how the 7410 HD TLS Generator module and the 5400 SPG/TSG module can be combined to provide complete digital, analog and audio reference outputs which can then be distributed throughout a facility.



7410 HD TLS Gen Block Diagram

INSTALLATION

Plug the 7410 module into any one of the slots in the 3 RU frame or 1 RU frame. Install the plastic overlay provided onto the corresponding group of rear BNC connectors associated with the module location. Note that the plastic overlay has an optional adhesive backing for securing it to the frame. Use of the adhesive backing is only necessary if you would like the location to be permanent and is not recommended if you need to change module locations. This module may be hot-swapped (inserted or removed) without powering down or disturbing performance of the other modules in the system.

CABLING

Refer to the 3 RU and 1 RU backplane diagrams of the module on the next page for cabling instructions. Note that unless stated otherwise, the 1 RU cabling explanations are identical to those given in the 3 RU diagram.

MODULE CONFIGURATION AND CONTROL

The configuration parameters for each Avenue module must be selected after installation. This can be done remotely using one of the Avenue remote control options or locally using the module front panel controls. Each module has a **REMOTE/LOCAL** switch on the front edge of the circuit board which must first be set to the desired control mode.

The configuration parameter choices for the module will differ between **Remote** and **Local** modes. In **Remote** mode, the choices are made through software and allow more selections.

If you are not using a remote control option, the module parameters must be configured from the front panel switches. Parameters that have no front panel control will be set to a default value. The **Local** switches are illustrated in the following section called **Front Panel Controls and Indicators**.

Avenue module parameters can be configured and controlled remotely from one or both of the remote control options, the Avenue Touch Screen or the Avenue PC Application. Once the module parameters have been set remotely, the information is stored on the module CPU. This allows the module be moved to a different cell in the frame at your discretion without losing the stored information. Remote configuration will override whatever the switch settings are on the front edge of the module.

For setting the parameters remotely using the Avenue PC option, refer to the **Avenue PC Remote Configuration** section of this document.

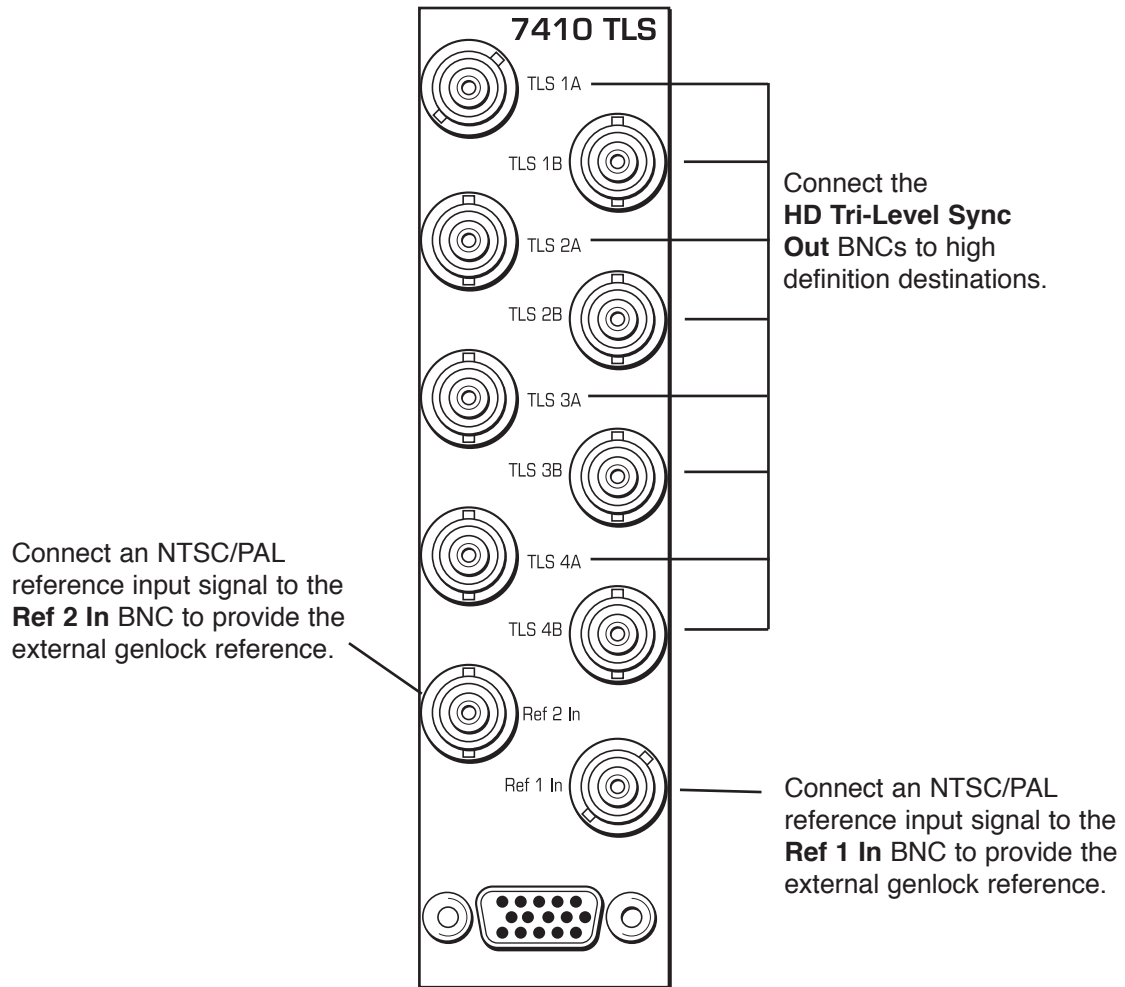
For setting the parameters remotely using the Avenue Touch Screen option, refer to the **Avenue Touch Screen Remote Configuration** section of this data pack following Avenue PC.

Making Reference Choices

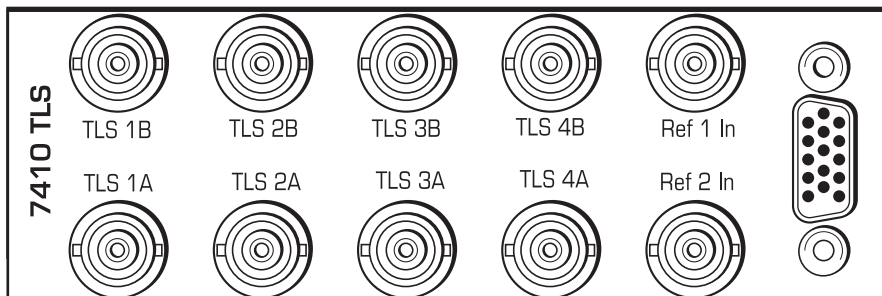
Each generator can be independently set to operate either as a Master Sync Generator (using an internal precision frequency reference), or genlocked to either of the two external reference sources of composite video. The frame's Master Reference input accepts a 625 or 525 composite reference or A 10 MHz sine or square wave.

In order to provide the ultimate in flexibility, each generator can then be set to an HD standard. These output choices are possible even when the generators are locked to a genlock input in a different standard.

3 RU Backplane



1 RU Backplane



Front Panel Controls and Indicators

Each front edge indicator and switch setting is shown in the diagram below:

Ref 525, 625 and 10 MHz

green LEDs:

One LED will light to indicate which reference rate is currently being detected.

OFF when rate is not detected.

Ref 525/625 green LEDs:

One LED will light to indicate which reference rate is currently being detected.

OFF when rate is not detected.

Remote/Local switch:

Set to the mode you will be using.

Run green LED:

OFF:

A power fault or halted CPU

ON:

A halted CPU

FAST BLINK:

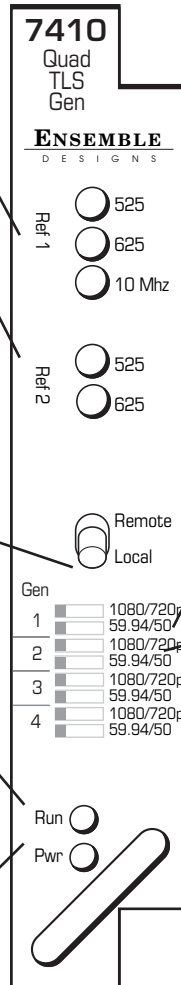
CPU Run error

SLOW BLINK:

System OK. (If SPI control is active from the main frame System Control Module, all Run indicators will be synchronized.)

Pwr green LED:

Indicates the presence (**ON**) or absence (**OFF**) of power (+5V).



HD TLS

1080/720p switch:

Set to either **1080** (left) or **720p** (right) for the type of tri-level HD sync output desired for Gen 1. Do the same for Gen 2, Gen 3 and Gen 4.

59.94/50 switch:

After selecting the above 1080 or 720p, then select either 59.94 or 50 Hz for Gen 1. Do the same for Gen 2, Gen 3 and Gen 4.

7410 Avenue Touch Screen Menus

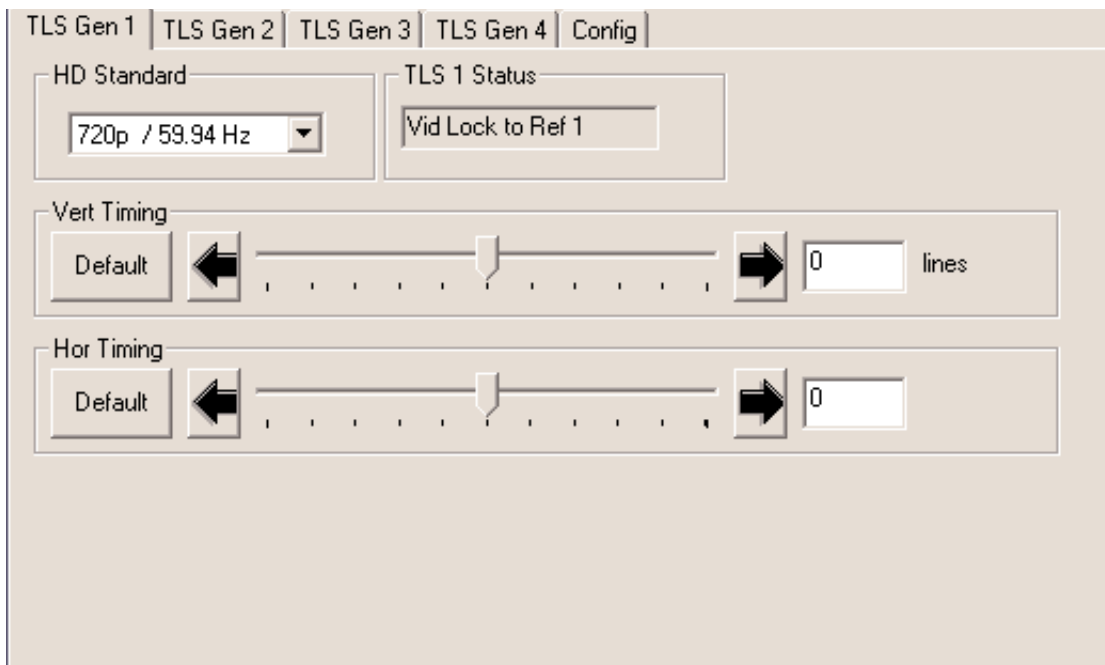
The **TLS Gen 1** menu screen shown below allows you to set the following parameters for the first generator output:

- **HD Standard** – select the HD Standard desired: 720p 50 Hz, 720p 59.94, 720p 60, 1080i 50, 1080i 59.95, 1080i 60, 1080p 23.98, 1080p 24, 1080p 25, 1080sF 23.98, 1080sF 24, or 1080sF 25.
- **TLS 1 Status** – reports the lock status as one of the following: Ext 10 Mhz Ref, Internal Ref, Video Lock to Ref 1, Clk lock to Ref 1, Vid Lock to Ref 2, Clk Lock to Ref 2, or No Ref - Freerun. .

Use the controls to set the timing of the Primary composite output in relation to the reference with the following controls. For numerical choices, use the slider control to select a value or touch the number field at right to bring up a pop-up keypad. Enter a value and press the **Enter** key.

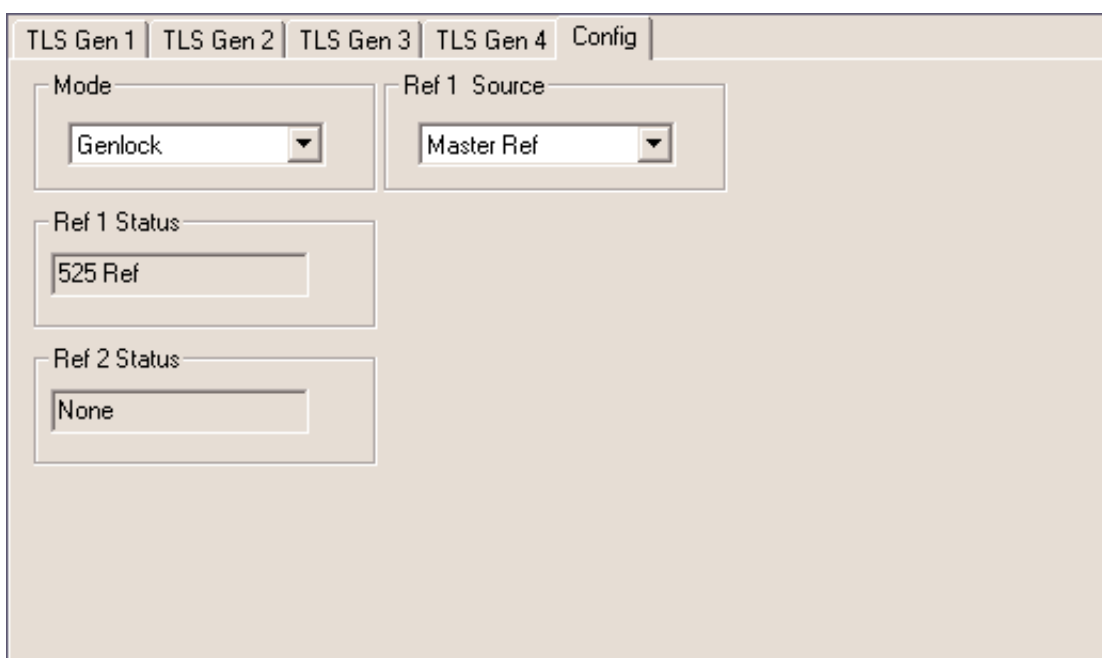
- **Vert Timing** – set the vertical timing in lines.
- **Hor Timing** – set the horizontal timing in clocks.

Use the same process for adjusting parameters for TLS Gen 2, Gen 3 and Gen 4.



The **Config** menu allows you to configure the reference from the two external inputs (525, 625 or 10 MHz sine wave) or the Master Frame Reference:

- **Config Ref** – select the desired module reference , either Genlock or Internal.
- **Ref 1 Source** – select Master Ref (frame reference) or Ext Ref (module reference).
- **Ref 1 Source** – reports 525 Ref, 625 Ref, 10Mhz Ref, or None
- **Ref 2 Source** – reports 525 Ref, 625 Ref, 10Mhz Ref, or None



The screenshot shows the 'Config' tab selected in the software interface. The 'Mode' dropdown menu is set to 'Genlock'. The 'Ref 1 Source' dropdown menu is set to 'Master Ref'. The 'Ref 1 Status' text field displays '525 Ref'. The 'Ref 2 Status' text field displays 'None'.

Avenue Touch Screen Remote Configuration

The Avenue Touch Screen remote control status menu for this module is illustrated and explained below. For more information on using Avenue Touch Screen, refer to the Avenue Touch Screen data pack that came with the option.

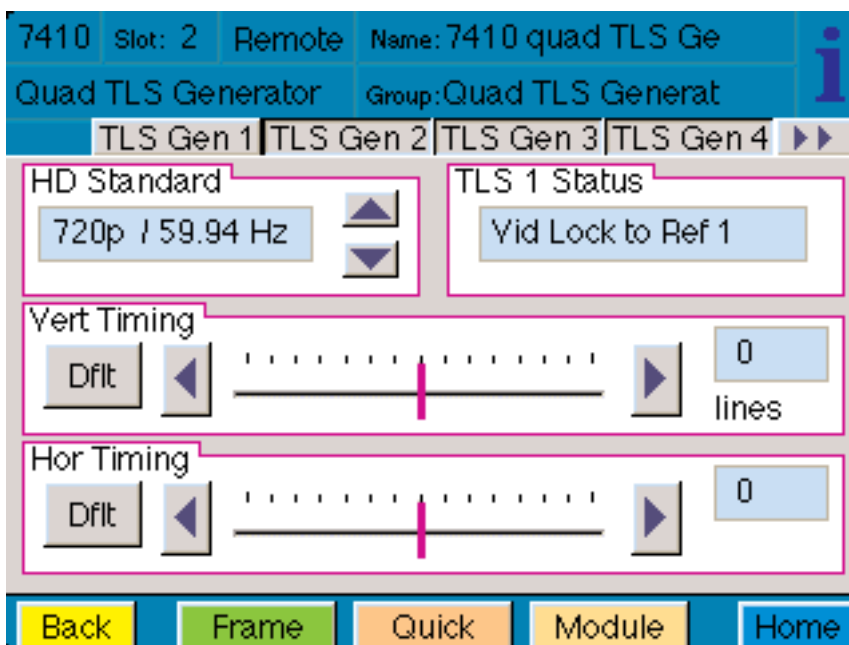
Parameter fields that are grayed out can indicate one of the following conditions:

- An option is not installed.
- The function is not active.
- The module is locked.
- The User Level set with Avenue PC is not accessible from the current User Level.

7410 Avenue Touch Screen Menus

The **TLS Gen 1** menu screen shown below allows you to set the following parameters for the first generator output:

- **HD Standard** – select the HD Standard desired: 720p 50 Hz, 720p 59.94, 720p 60, 1080i 50, 1080i 59.95, 1080i 60, 1080p 23.98, 1080p 24, 1080p 25, 1080sF 23.98, 1080sF 24, or 1080sF 25.
- **TLS 1 Status** – reports the lock status as one of the following: Ext 10 Mhz Ref, Internal Ref, Video Lock to Ref 1, Clk lock to Ref 1, Vid Lock to Ref 2, Clk Lock to Ref 2, or No Ref - Freerun. .



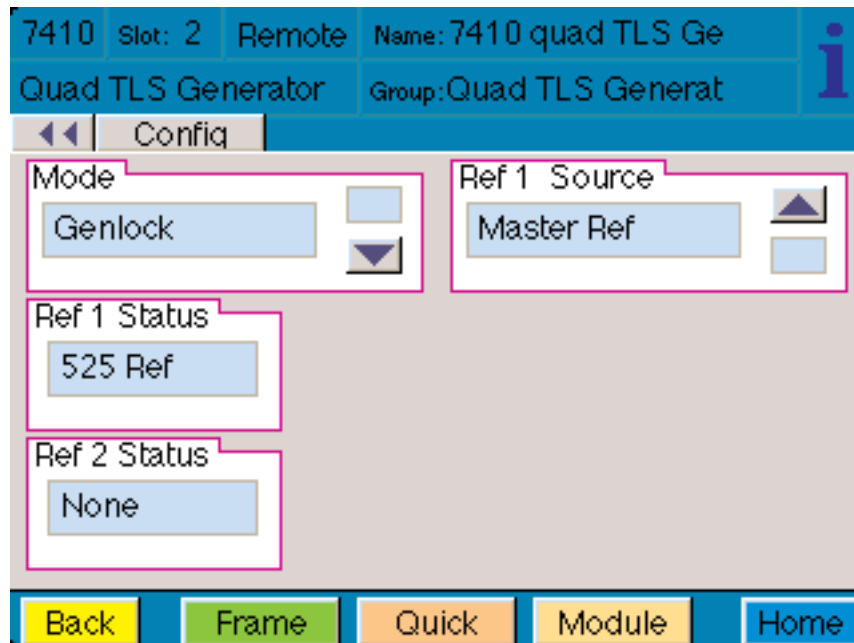
Use the controls to set the timing of the Primary composite output in relation to the reference with the following controls. For numerical choices, use the slider control to select a value or touch the number field at right to bring up a pop-up keypad. Enter a value and press the **Enter** key.

- **Vert Timing** – set the vertical timing in lines.
- **Hor Timing** – set the horizontal timing in clocks.

Use the same process for adjusting parameters for TLS Gen 2, Gen 3 and Gen 4.

The **Config** menu allows you to configure the reference from the two external inputs (525, 625 or 10 MHz sine wave) or the Master Frame Reference:

- **Config Ref** – select the desired module reference , either Genlock or Internal.
- **Ref 1 Source** – select Master Ref (frame reference) or Ext Ref (module reference).
- **Ref 1 Source** – reports 525 Ref, 625 Ref, 10Mhz Ref, or None
- **Ref 2 Source** – reports 525 Ref, 625 Ref, 10Mhz Ref, or None



TROUBLESHOOTING

As a troubleshooting aid, the reference signal status and presence, power and CPU status can be easily monitored from the front panel of this module using the front panel indicators.

Refer to the overall troubleshooting tips given below for the **7410** module:

Error light is lit on front panel:

- Module is not locking to a selected reference. At least one of the **Ref** LEDs should be lit to indicate presence and status of reference input

No Ref 1 or Ref 2 indication:

- Module is not locking to 525 or 625. At least one of the **Ref** LEDs LEDs should be lit to indicate locking status.

Can't control module:

- Check status of CPU **Run** green LED. Should be blinking slowly and in unison with other modules if System module is present. If not, try removing it and plugging it in again to be sure it is seated properly.
- System module may not be working properly if installed.

Module controls are grayed out:

- Module is locked or access to module controls is restricted by User Level.
- Local/Remote switch on module is in the **Local** position.

No signal out of module:

- Check status of **Ref** green LEDs. One should be lit. If not, check the reference input or master frame signal for presence and quality.
- Check cabling to input of module.

You may also refer to the technical support section of the Ensemble Designs web site for the latest information on your equipment at the URL below:

<http://www.ensembledesigns.com/support>

SOFTWARE UPDATING

Software upgrades for each module can be downloaded remotely if the optional System Control module is installed. These can be downloaded onto your PC and then Avenue PC will distribute the update to the individual module. (Refer to the Avenue PC documentation for more information) Periodically updates will be posted on our web site. If you do not have the required System Control Module and Avenue PC, modules can be sent back to the factory for software upgrades.

WARRANTY AND FACTORY SERVICE

Warranty

This module is covered by a five year limited warranty, as stated in the main Preface of this manual. If you require service (under warranty or not), please contact Ensemble Designs and ask for customer service before you return the unit. This will allow the service technician to provide any other suggestions for identifying the problem and recommend possible solutions.

Factory Service

If you return equipment for repair, please get a Return Material Authorization Number (RMA) from the factory first.

Ship the product and a written description of the problem to:

Ensemble Designs, Inc.

Attention: Customer Service RMA #####

870 Gold Flat Rd.

Nevada City, CA. 95959 USA

(530) 478-1830

Fax: (530) 478-1832

service@ensembledesigns.com

<http://www.ensembledesigns.com>

Be sure to put your RMA number on the outside of the box.

SPECIFICATIONS

Model 7410 HD Tri-Level Sync Generator

Reference Input Signal

Number	Two on module (and one alternate: Frame Master Reference)
Signal Type	1V p-p PAL, NTSC, or 10 MHz
Return Loss	>40 dB DC to 5.5 MHz

Tri-Level Sync Output

Number	Eight, 75 Ω
Type	1080i (SMPTE 274M -4,5,6) 50, 59.94 or 60 Hz 720p (SMPTE 296M -1,2,3) 50, 59.94 or 60 Hz 1080p (SMPTE 274M -9,10,11) 23.98, 24, 25 Hz 1080sF (RP211 -14,15,16) 23.98, 24, 25 Hz
Output DC	± 50 mV
Return Loss	>30 dB to 30 MHz

General Specifications:

Power Consumption:	7 Watts
Temperature Range:	0 to 40 degrees C ambient (all specs met)
Relative Humidity:	0 to 95% noncondensing
Altitude:	0 to 10,000 ft
Fusing:	1.5 Amp PTC resettable fuse

Due to ongoing product development, all specifications subject to change.